

EFFECTS OF OXIDANTS/ANTIOXIDANTS ON DENGUE VIRUS NS2B/NS3 PROTEASE ACTIVITY AND ITS IMPLICATIONS IN VIRAL INFECTION

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Oxidants play important roles in the pathogenesis and progression of viral infections, which include their involvement in viral attachment, virus-cell fusion, viral replication and maturation as well as release of virus particles from infected cells. Efforts have been made to establish relationships between oxidants and viral infection in various types of infectious diseases. However, limited information is available with regards to the links between the infection and oxidants at molecular level. Our studies on dengue virus NS2B/NS3 protease has provided some insights into the relationships between the level of exposure to oxidants/antioxidants and their autocatalytic activities. We observed that the level of autocatalytic activity of dengue virus NS2B/NS3 protease was markedly elevated in the presence of hydrogen peroxide. This enhancement might be critical in the event of viral replication when such protease activity is required for the posttranslational processing of viral polyproteins. Based on our findings as well as evidence reported from other viral infections, a plausible molecular mechanism illustrating the involvement of a peroxide compound as oxidant in the proteolytic cleavage of a viral polyprotein by a viral protease is proposed. The involvement of oxidants in other viral infections are also reviewed in the context of their roles in viral infection.

keywords: antioxidant, oxidant, viral infection, viral protease activity